6 Teaching

6.1 Academic Advising

6.1.1 Summary

Type	Capacity	In Progress	Completed	Total
First Year	Advisor	3	13	16
Bachelor's	Advisor	0	2	2
Master's	Advisor	0	9	9
Master's	Co-Advisor	0	5	5
Master's	Committee	0	1	1
Master's	**Total**	**0**	**15**	**15**
Engineer's	–	0	0	0
Doctoral	Advisor	3	2	5
Doctoral	Co-Advisor	0	0	0
Doctoral	Committee	0	2	2
Doctoral	**Total**	**3**	**4**	**7**
Post-Docs	As PI	1	4	5
Undergraduate Capstone	Total	0	2	2
Undergraduate Research	Total	0	24	24
MEM Project	Total	2	1	3
Graduate Research	Total	0	5	5
Summer Internship	Total	0	3	3
Total		**9**	**61**	**82**

Bachelor's Theses: [2, 1]

Master's Theses: [15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1]

Doctoral Thesis: [7, 6, 5, 4, 3, 2, 1]

Post-Docs: [5,4,3,2,1]

First Year: [16, 15,14,13,12,11,10,9,8,7,6,5,4,32,1]

Undergraduate Capstone: [2,1]

Undergraduate Research: [24,23,22,21,20,19, 18, 17, 16, 15, 14, 14,13,12,11,10,9,8,7,6,5,4,3,2,1]

MEM Project: [3, 2,1]

Graduate Research: [5,4,3,2,1]

Summer Internship Research: [3,2,1]

6.1.2 Bachelor's Thesis Advising

[2] J. Bonham, "The vulnerability of us energy infrastructure to drought and flood conditions," Master's thesis, Department of Computer Science. Dartmouth College, 2020.

[1] L. Xu, "A comparison of graph measures of hetero-functional graphs versus traditional graphs for the new england electric power system," Master's thesis, Department of Computer Science. Dartmouth College, 2018.

6.1.3 Master's Thesis Advising

[15] T. J. van der Wardt, "Dynamic CO2 emissions calculation of the transportation electricity nexus," Master's Thesis, (Visiting Student) Vrije Universiteit, 2016.

[14] D. F. Allan, "Enhanced electric vehicle adoption scenarios for abu dhabi road transportation," Master's Thesis, Masdar Institute of Science & Technology, 2015.

[13] B. Jiang, "An Enterprise Control Assessment Approach for the Integration of Demand Side Resources (MIT-CoAdvise)," Master's Thesis, MIT, 2015.

[12] T. Sooriyaarachchi, "Human Capital Need Assessment and Value Chain Capture in Renewable Energy Sector in UAE (On Committee)," Master's thesis, Masdar Institute of Science & Technology, 2014.

[11] L. R. Gilbert III, "Sustainable Design Methodology for Temporary Housing (Co-Advised)," Master's thesis, Masdar Institute of Science & Technology, 2014.

[10] F. Liu, "Coordinated Control of Stability for Microgrids with Building Cooling Systems and Ramping Rate Limitations (MIT Co-Advised)," Master's Thesis, MIT, 2014.

[9] W. N. Lubega, "An Engineering Systems Approach to the Modeling and Analysis of the Energy-Water Nexus," Master's Thesis, Masdar Institute of Science & Technology, 2014.

[8] M. Alamoodi, "Streamlining Environmental Reporting using Matlab," Master's Thesis, Hamdan Bin Mohammed e-University, 2013. [Online]. Available: http://amfarid.scripts.mit.edu/resources/Theses/IES-T08.pdf

[7] M. A. Abdullah, "A Participatory Approach to Rural Energy Systems: Design, Planning and Implementation (MI-Coadvised)," Master's Thesis, Masdar Institute of Science and Technology, 2013.

[6] R. Al Junaibi, "Technical Feasibility Assessment of Electric Vehicles in Abu Dhabi," Master's Thesis, Masdar Institute of Science and Technology Engineering Systems & Management Department, 2013. [Online]. Available: http://amfarid.scripts.mit.edu/resources/Theses/TES-T06.pdf

[5] A. Muzhikyan, "A Holistic Assessment Method of Power System Imbalances in the Presence of Variable Energy Resources," Master's Thesis, Masdar Institute of Science and Technology, Abu Dhabi, UAE, 2013. [Online]. Available: http://amfarid.scripts.mit.edu/resources/Theses/SPG-T05.pdf

[4] R. C. Francy, "Enhanced Power System State Estimation Techniques for the Incorporation of Variable Energy Resources," Master's Thesis, Masdar Institute of Science and Technology, Abu Dhabi, UAE, 2013. [Online]. Available: http://amfarid.scripts.mit.edu/resources/Theses/SPG-T04.pdf

[3] A. Santhosh, "Optimized Real Time Dispatch of Generation in Power and Water Networks," Master's Thesis, Masdar Institute of Science & Technology, 2013.

[2] H. M. Abdelhalim, "Stability Effects of Frequency Controllers and Transmission Line Configurations on Power Systems with Integration of Wind Power (MIT-Coadvised)," Master's Thesis, MIT, 2012. [Online]. Available: http://amfarid.scripts.mit.edu/resources/Theses/SPG-T02.pdf

[1] M. F. Aftab, "Towards Automated Demands Side Management for Large Scale Supermarkets-M.Sc. Thesis," Master's Thesis, Masdar Institute of Science & Technology, Abu Dhabi, UAE, 2012. [Online]. Available: http://amfarid.scripts.mit.edu/resources/Theses/IEM-T01.pdf

6.1.4 Doctoral Thesis Advising

[7] V. Khong, "Intelligent energy systems for resilient artic communities (primary advisor)," Ph.D. dissertation, Thayer School of Engineering at Dartmouth, 2021-2026.

[6] D. Thompson, "A hetero-functional graph theory analysis of the american multi-modal energy system (primary advisor)," Ph.D. dissertation, Thayer School of Engineering at Dartmouth, 2018-2023.

[5] K. Wei, "Schedule Planning and Endogeneity of Travelers' Decisions in Congested Large-Scale Transportation Networks(on committee)," Ph.D. Thesis, Thayer School of Engineering at Dartmouth, 2018.

[4] P. A. Kyaw, "Optimization of Switched Inductor Networks as Power Electronic Passive Component Structures (on qualifying exam committee)," Ph.D. Thesis, Thayer School of Engineering at Dartmouth, 2015.

[3] S. O. Muhanji, "Distributed enterprise control assessment for the future electricity grid (primary advisor)," Ph.D. Thesis, Thayer School of Engineering at Dartmouth, 2016-2021.

[2] W. C. Schoonenberg, "Industrial demand side management of islanded microgrids with integrated renewable energy (primary advisor)," Ph.D. Thesis, Thayer School of Engineering at Dartmouth, 2015-2021.

[1] A. Muzhikyan, "Power system enterprise control framework for the numerical and analytical determination of operating reserve requirements in the presence of variable energy and energy storage resources (primary advisor)," Ph.D. Thesis, Thayer School of Engineering at Dartmouth, 2017-2018. [Online]. Available: http://engineering.dartmouth.edu/liines/Theses/SPG-TP01.pdf

6.1.5 Postdoctoral Advising

1. Orkun Karabasogolu. Research Area: Energy Storage & Electric Vehicles. Ph.D. from Carnegie Mellon University Mechanical Engineering Department. July 2013 - October 2013.

2. Sergio Rivera. Research Area: Power Systems Engineering. Universidad Nacional de San Juan (San Juan, Argentina). March 2013 - November 2013.

3. Asha Viswanath. Research Area: Electric Vehicle Integration. University of Southampton, U.K. January 2013 - December 2013.

4. Ambrose Adegbege. Research Area: Control Theory. University of Manchester, U.K. October 2011 - September 2012.

5. Himadri Basu. Research Area: Energy Systems Control Theory. University of New Hampshire. USA. October 2020-January 2021.

6.1.6   First Year Advising

1. 2017-2018. Dylan C. Cerveny

2. 2017-2018. Pierre G. Breau

3. 2017-2018. Evan Z. Muscatel

4. 2018-2019 Jeffrey J. Losurdo

5. 2018-2019 Rylan B. Tribush

6. 2018-2019 David S. Yin

7. 2018-2019 Caroline R. Tornquist

8. 2018-2019 Jason R. McFadden

9. 2019-2020 Lauren R. Ferridge

10. 2019-2020 Abigail H. Owen

11. 2019-2020 Kealia K. Haitsuka

12. 2019-2020 Matthew R. Blouch

13. 2019-2020 Ariana I. Arvelo

14. 2020-2021 Shane M. Bauer

15. 2020-2021 Anisia G. Tiplea

16. 2020-2021 Daphne G. Eidson

6.1.7   Undergraduate Capstone Project Advising

1. 2018-19 ENGS 89-90 Dartmouth Formula Hybrid Car Team

2. 2019-20 ENGS 90-90 Dartmouth Solar Design

6.1.8   Undergraduate Research & Independent Projects (Non-Thesis)

1. William Hickman. Dartmouth. Research Area: Energy Water Nexus. October 2015 - June 2016.

2. Steffi Muhanji. Dartmouth. Research Area: Transactive Energy Control in Smart Grids. October 2015 - June 2016.

3. Annaka Balch. Dartmouth. Research Area: Simulation of Electric Vehicles on EPA Drive Cycles. Summer 2016.

4. Zachary Berzolla. Dartmouth. Research Area: Visualization of Power Grid Topologies. Summer 2016-2017.

5. Krisda Chugh. Chulalongkorn Visiting Student. Research Area: Simulation of Electric Vehicles on EPA Drive Cycles. Fall 2016.

6. Shaun Sengupta. Dartmouth. Independent Project: Controller Design, Testing, and Implementation for Dartmouth Formula Racing Hybrid Vehicle. Fall 2016-Spring 2017.

7. Dakota Thompson. Dartmouth. Research Area: Discrete-Event Visualization of Transportation Electrification, Production, and Healthcare Systems. Fall 2016.

8. Catherine Carey. Dartmouth. Research Area: Energy Water Nexus. Summer 2017 - Spring 2018.

9. Maxwell Coleman. Dartmouth. Research Area: Energy Water Nexus. Spring 2018.

10. Akwasi Akosah. Dartmouth. Research Area: GIS Data Analytics. Summer 2019.

11. Joseph W. Coleman. Dartmouth. Research Area: GIS Data Analytics. Summer 2019, Winter 2021.

12. Jesse C. Lin. Dartmouth. Research Area: GIS Data Analytics. Summer 2019.

13. Tyler Neath. Dartmouth. Research Area: GIS Data Analytics. Summer 2019.

14. Ivana Devic. Dartmouth. Research Area: Transactive Energy Blockchain. Fall 2019.

15. Megan Clark. Dartmouth. Research Area: Hetero-functional Graph Theory. Summer 2020.

16. Emma Dougherty. Dartmouth. Research Area: Smart Cities. Summer 2020..

17. Robert Carangelo. Darmouth. Resarch Area: energy Internet of Things. Summer 2020. .

18. Nicholas Awertschenko. Dartmouth. Research Area: Disaggregation Algorithms. Summer 2020.

19. John C. Ejiogu. Dartmouth. Research Area: Sustainable Energy Development (Nigeria). Summer 2020.

20. Taylor Hickey. Dartmouth. Research Area: Electric Power System Data Analytics. Spring 2021.

21. Sophie Edelman. Dartmouth. Research Area: Python Hetero-functional Graph Theory Toolbox. Spring 2021.

22. Nathaniel Roe. Dartmouth. Research Area: Electric Power System Data Analytics. Spring 2021.

23. Barkin Kavardoglu. Dartmouth. Research Area: Transactive Energy Blockchain. Spring 2021.

24. Derek Wilson. Dartmouth. Research Area: MATLAB Hetero-functional Graph Theory Toolbox. Spring 2021.

6.1.9 Undergraduate Capstone Project Advising

1. 2018-9 ENGS 89-90 Dartmouth Formula Hybrid Car Team

6.1.10 MEM Project Advising

1. Karen Uchiyama. Developing a High Performance Human Machine Interface. Summer 2016.

2. Adejadesola Atanda. Techno-economic Assessment of the Sustainable H_2O Water Treatment Technology. Spring-Summer 2021.

3. Hendric Tronsson. Techno-economic Assessment of the Sustainable H_2O Water Treatment Technology. Spring-Summer 2021.

6.1.11 Graduate Research (Non-Thesis)

1. Richard Zhang. MIT. Integration of Large Scale Variable Energy Resources. Future of the Electricity Grid. Fall 2010 - June 2011.

2. Andrew Whittaker. MIT. Enhancing the Transmission System. Future of the Electricity Grid. Fall 2010 - June 2011.

3. Samantha Gunther. MIT. Distributed Generation & Electric Vehicles. Future of the Electricity Grid. Fall 2010 - June 2011.

4. Babar Rasheed. COMSATS Institute of Information Technology Visiting Student. Optimal Network Flow of the Energy-Water Nexus. Fall 2016-Spring 2017.

5. Alison E. Flint. Dartmouth. Energy Internet of Things. Fall 2017-Winter 2017.

6.1.12 Summer Internship Research

1. Muna Moqbel. Masdar Institute. Smart Grid Simulation. Summer 2012 Internship.

2. Samah Alberi. Masdar Institute. Smart Grid Simulation. Summer 2012 Internship.

3. Abdullah Alblooshi. Masdar Institute. Smart Grid Simulation. Summer 2012 Internship.

6.2   Curriculum Development

6.2.1   New Course Development

Fall 2011:	ESM 501 Systems Architecting
Spring 2012:	ESM 616 Techno-Economic Analysis in Power Systems Operation & Planning
Winter 2018	ENGG 199 Model-Based Systems Engineering, Analysis & Simulation

6.2.2   Major Course Revisions

Fall 2016:	ENGS 22 Systems (New Integrated Pedagogy)
Spring 2016:	ENGS 175 Energy Systems (Greater Content in Quantitative Methods)
Spring 2019:	ENGS 175 Energy Systems (Dual Focus on Optimization & Socio-Technical Discussions)
Fall 2020:	ENGS 22 Systems (Flipped for COVID-19)

6.2.3   Tutorial Development for LIINES

2017:	LIINES Manual – Where to Start so as to Work Collaboratively & Efficiently (20 Chapters)
2012:	LaTeX Tutorial

6.3   Teaching Experience

6.3.1   Dartmouth Faculty Teaching Experience

Term	Course Code	Title	Role	Course Type
Winter 2021	ENGS 199	Model-Based Systems Engineering, Analysis & Simulation	Lead Lecture	Lecture
Fall 2020	ENGS 22	Systems	Lead Lecturer	Lecture & Lab
Spring 2020	ENGS 175	Energy Systems	Lead Lecturer	Lecture
Winter 2020	ENGS 199	Model-Based Systems Engineering, Analysis & Simulation	Lead Lecture	Lecture
Fall 2019	ENGS 22	Systems	Lead Lecturer	Lecture & Lab
Spring 2019	ENGS 175	Energy Systems	Lead Lecturer	Lecture

56

Winter 2019	ENGS 199	Model-Based Systems Engineering, Analysis & Simulation	Lead Lecture	Lecture
Fall 2018	ENGS 22	Systems	Lead Lecturer	Lecture & Lab
Spring 2018	ENGS 175	Energy Systems *(Canceled due to low enrollment)*	Lead Lecturer	Lecture
Winter 2018	ENGS 199	Model-Based Systems Engineering, Analysis & Simulation	Lead Lecture	Lecture
Fall 2017	ENGS 22	Systems	Lead Lecturer	Lecture & Lab
Spring 2017	ENGS 175	Energy Systems	Lead Lecturer	Lecture
Fall 2016	ENGS 22	Systems	Lead Lecturer	Lecture & Lab
Spring 2016	ENGS 175	Energy Systems	Lead Lecturer	Lecture

6.3.2   Masdar Institute Faculty Teaching Experience

Term	Course Code	Title	Role	Course Type
Spring 2015	ESM 616	Techno-Economic Analyses in Power Systems Operation & Planning	Lead Lecturer	Lecture
Fall 2014	ESM 501	Systems Architecting	Lead Lecturer	Lecture
Spring 2014	ESM 616	Techno-Economic Analyses in Power Systems Operation & Planning	Lead Lecturer	Lecture
Fall 2013	ESM 501	Systems Architecting	Lead Lecturer	Lecture
Spring 2013	UCC 501	Sustainable Energy	12% Lecturer	Lecture
Spring 2013	ESM 616	Techno-Economic Analyses in Power Systems Operation & Planning	Lead Lecturer	Lecture
Fall 2012	ESM 501	Systems Architecting	Lead Lecturer	Lecture
Spring 2012	ESM 616	Techno-Economic Analyses in Power Systems Operations & Planning	Lead Lecturer	Lecture
Fall 2011	ESM 501	Systems Architecting	Lead Lecturer	Lecture

6.3.3 Other Teaching Experience

Term	Course Code Title	Role	Course Type
Spring 2006	University of Cambridge Institute for Manufacturing: Organization & Control of Manufacturing Systems	Teaching Assistant	Recitation
Spring 2006	University of Cambridge Judge Business School: Operations Management.	Teaching Assistant	Recitation
Spring 2005	University of Cambridge Institute for Manufacturing: Organization & Control of Manufacturing Systems	Teaching Assistant	Recitation
Spring 2005	University of Cambridge Judge Business School: Operations Management.	Teaching Assistant	Recitation
2005-2007	Smarthiking.com: Math, Physics, Chemistry	Web-Tutor	MOOC
2002	Professional Engineering Exam	Tutor	Private
1998-2000	MIT Undergraduate Associate Advisor & Orientation Leader	Counseling	Small Group
1997	MIT Edgerton Center Curriculum Developer & Teacher (CD&T)	CD&T	Small Group